

**H.R. 5866**  
**Nuclear Energy Research and Development Act of 2010**  
**Section-by-Section Analysis**

**SECTION 1. SHORT TITLE**

Nuclear Energy Research and Development Act of 2010

**SECTION 2. OBJECTIVES**

Amends Section 951(a) of the Energy Policy Act of 2005 to include the following objectives:

- (1) Reducing the costs of nuclear reactor systems
- (2) Reducing used nuclear fuel and nuclear waste products generated by civilian nuclear energy
- (3) Supporting technological advances in areas that industry is not likely to undertake because of technical and financial uncertainty

**SECTION 3. FUNDING**

Amends Section 951 of the Energy Policy Act of 2005 to provide the following authorizations for Subtitle E programs:

- A. Total Program's Authorization
  - (1) \$419,000,000 in FY 2011
  - (2) \$429,000,000 for fiscal year 2012; and
  - (3) \$439,000,000 for fiscal year 2013.
- B. Breakout of total Authorization for Activities under Section 953 for the Fuel Cycle Research and Development Program
  - (1) \$201,000,000 for fiscal year 2011;
  - (2) \$201,000,000 for fiscal year 2012; and
  - (3) \$201,000,000 for fiscal year 2013.
- C. Breakout of total Authorization for Activities under Section 952 for Nuclear Energy Research and Development Programs other than those described in 952(d)
  - (1) \$64,000,000 for fiscal year 2011;
  - (2) \$64,000,000 for fiscal year 2012; and
  - (3) \$64,000,000 for fiscal year 2013.
- D. Breakout of total Authorization for Activities under Section 952(d) for the Small Modular Reactor Program
  - (1) \$55,000,000 for fiscal year 2011;
  - (2) \$65,000,000 for fiscal year 2012; and
  - (3) \$75,000,000 for fiscal year 2013.
- E. Breakout of total Authorization for Activities under Section 958 for the Nuclear Energy Enabling Technologies Program
  - (1) \$99,000,000 for fiscal year 2011;
  - (2) \$99,000,000 for fiscal year 2012; and
  - (3) \$99,000,000 for fiscal year 2013.

## **SECTION 4. NUCLEAR ENERGY RESEARCH AND DEVELOPMENT PROGRAMS**

This section amends Section 952 of the Energy Policy Act of 2005 by striking subsections (c) through (e) and inserting a Reactor Concepts Program that authorizes research into advanced reactor designs and technologies to prolong the life of currently deployed reactor systems. Technologies that may be researched under this section include those that are economically competitive with other electric power generation plants, have higher energy efficiency, lower cost and improved safety compared to current reactors, utilize passive safety systems, minimize proliferation risks, reduce production of high-level waste per unit of output, increase the life and sustainability of deployed reactor systems, use improved instrumentation, or are capable of producing large-scale quantities of hydrogen or process heat. This section also requires the Secretary to seek opportunities for international cooperation.

## **SECTION 5. SMALL MODULAR REACTOR PROGRAM**

This section amends Section 952 of the Energy Policy Act of 2005 by creating a Small Modular Reactor program to promote the research, development, demonstration, and commercial application of small modular reactors (SMRs). Under this section SMRs are defined as reactors with a rated capacity of 300MWe or less and can be constructed and operated in combination with similar reactors at a single site.

In conducting this program the Secretary may enter into cooperative agreements to support SMR designs that enable lower capital costs or increased access to private financing, reduced long-term radio-toxicity, mass, or decay heat of waste, increased operating safety of nuclear facilities, reduced dependence of reactor systems on water resources, increased seismic resistance of nuclear generation, reduced proliferation risk, and increased efficiency in reactor manufacturing.

To be eligible to enter into the agreement an applicant must submit a proposal that documents all partners and suppliers involved in the project and a description of anticipated domestic and international activities, measures to be undertaken to enable cost-effective implementation of the SMR project, an accounting structure approved by the Secretary, and all known assets that shall be contributed to satisfy the non-Federal share requirement.

This program will require any applicant to be responsible for at least 50% of the cost of the project and that cost may only be satisfied through the use of non-Federal dollars.

In selecting winners of awards or cooperative agreements the Secretary shall consider the domestic manufacturing capabilities of the parties and of their partners and suppliers, the viability of the reactor design and business plan of the parties, the potential of the reactor design to be developed without future federal subsidy, and the non-Federal share to be provided.

## **SECTION 6. FUEL CYCLE RESEARCH AND DEVELOPMENT**

This section amends Section 953 of the Energy Policy Act of 2005 by renaming the program “Fuel Cycle Research and Development.” Under this program the Secretary shall conduct fuel

cycle research and development of technologies to improve uranium resource utilization, maximize energy generation, minimize nuclear waste creation, improve safety, and mitigate risk of proliferation in support of a national strategy for spent nuclear fuel.

The fuel management options that may be considered under this program are open fuel cycle, modified open cycle, full recycle, advanced storage, alternative storage, or other appropriate technology areas. Open fuel cycle includes development of fuels for use in reactors that minimize waste creation. Modified open cycle includes development of fuel forms, reactors and limited separations of waste. Full recycle includes development of technologies to repeatedly recycle nuclear waste products to minimize total waste to the greatest extent possible. Advanced storage includes development of innovative storage technologies for both onsite and long-term storage. Alternative storage includes development of innovative long-term storage methods including deep borehole storage or salt dome storage.

Furthermore, under this section, the Secretary must consider the final Blue Ribbon Commission report. Within 180 days after release of the Blue Ribbon Commission Report the Secretary must transmit to Congress a report describing any plans the Department may have to incorporate relevant recommendations from the Commission.

## **SECTION 7. NUCLEAR ENERGY ENABLING TECHNOLOGIES**

This section amends the Energy Policy Act of 2005 by adding a new section 958 titled “Nuclear Enabling Technologies.” This program is to support integration of activities undertaken in 952(c) and 953 and support crosscutting technology development. Research activities may include those pertaining to advanced reactor materials, catastrophic radiation mitigation methods, proliferation and security risk assessment methods, sensors and instrumentation, manufacturing methods, or any crosscutting technology or transformative concept the Secretary deems relevant.

In conducting this program the Secretary must submit a report on and evaluation of these activities as part of the annual budget.

## **SECTION 8. EMERGENCY RISK ASSESSMENT AND PREPAREDNESS REPORT**

This section requires the Secretary to transmit to the Congress a report summarizing quantitative risks associated with the potential of a severe accident arising from the use of nuclear power, and outlining the technologies currently available to mitigate the consequences of such an accident. The report shall include recommendations of areas of technological development that should be pursued to reduce the public harm arising from such an incident.

## **SECTION 9. NEXT GENERATION NUCLEAR PLANT**

This section amends Section 642(b)(3) of the Energy Policy Act of 2005 to allow the location of the prototype power plant to be constructed in a location chosen by the Consortium through an open and transparent competitive selection process.

This section also requires GAO to undertake a report to provide a status update on the Next Generation Nuclear Plant (NGNP) indicating its progress, how Federal appropriated funds have been distributed and spent, and the current and expected participation by non-federal entities. The report shall also include an analysis of various challenges facing the NGNP project.

## **SECTION 10. TECHNICAL STANDARDS COLLABORATION**

This section requires the Director of the National Institute of Standards and Technology (NIST) to establish a nuclear energy standards committee to facilitate and support the development or revision of technical standards for new and existing nuclear power plants and advanced nuclear technologies.

The committee shall include representatives from the Federal Government and the private sector and the committee shall be co-chaired by a representative from NIST and a representative from a private sector standards organization.

The duties of the committee shall include: (1) performing a technical standards needs assessment; (2) formulating, coordinating, and recommending priorities for new technical standards and the revision of existing technical standards; (3) facilitating and supporting collaboration and cooperation among standards developers; (4) coordinating with other national, regional, or international efforts on nuclear energy-related technical standards; and (5) promoting the establishment and maintenance of a database of nuclear energy-related technical standards.

\$1 million is authorized to carry out this section for each of FY 2011 through FY 2013.